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UTAH GEOLOGICAL AND MINERAL SURVEY

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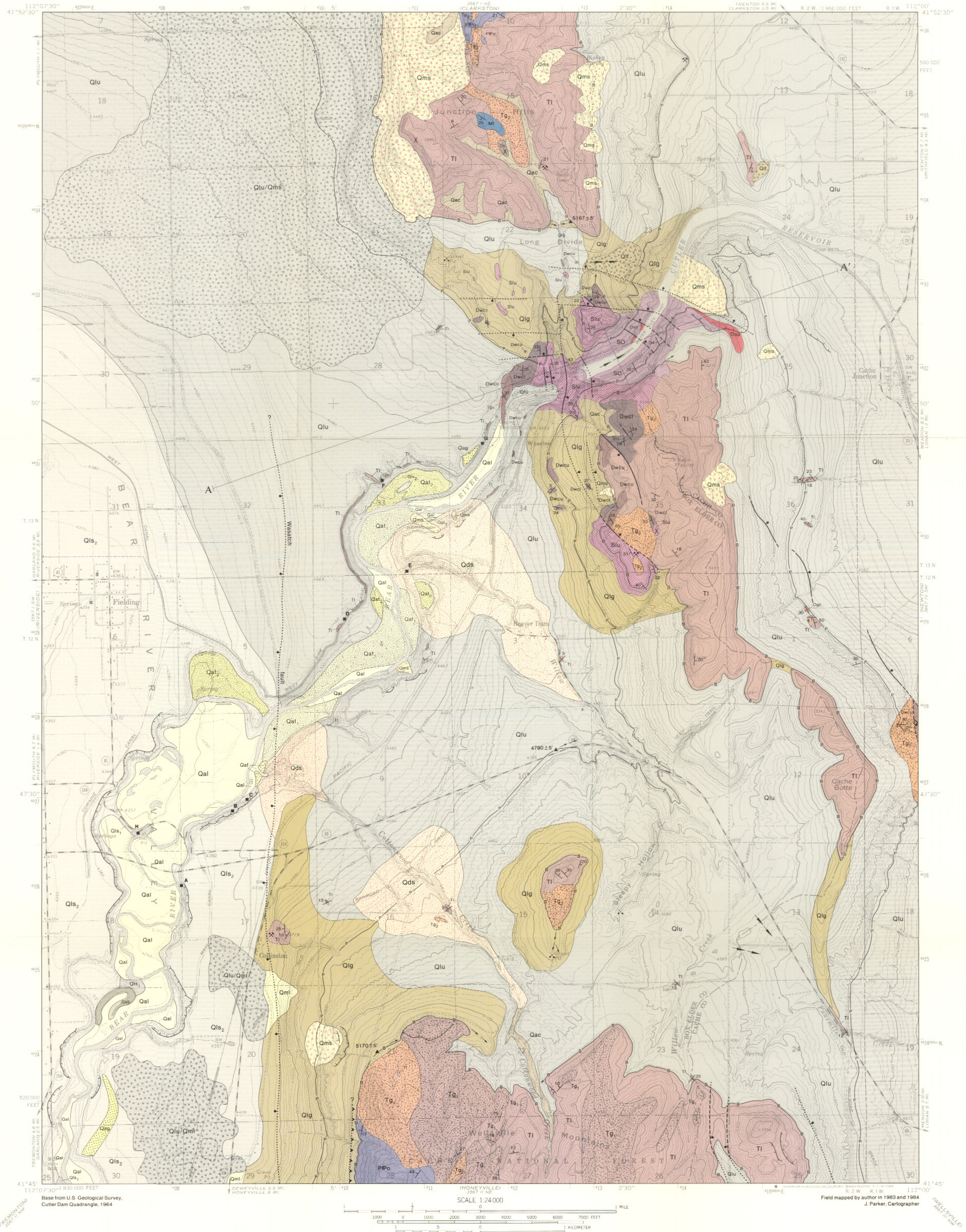
Plate 1
Utah Geological and Mineral Survey Map 91
Geologic Map of Cutler Dam Quadrangle



Base from U.S. Geological Survey,
Cutler Dam Quadrangle, 1964

Field mapped by author in 1983 and 1984
J. Parker, Cartographer

SCALE 1:24000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1964 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

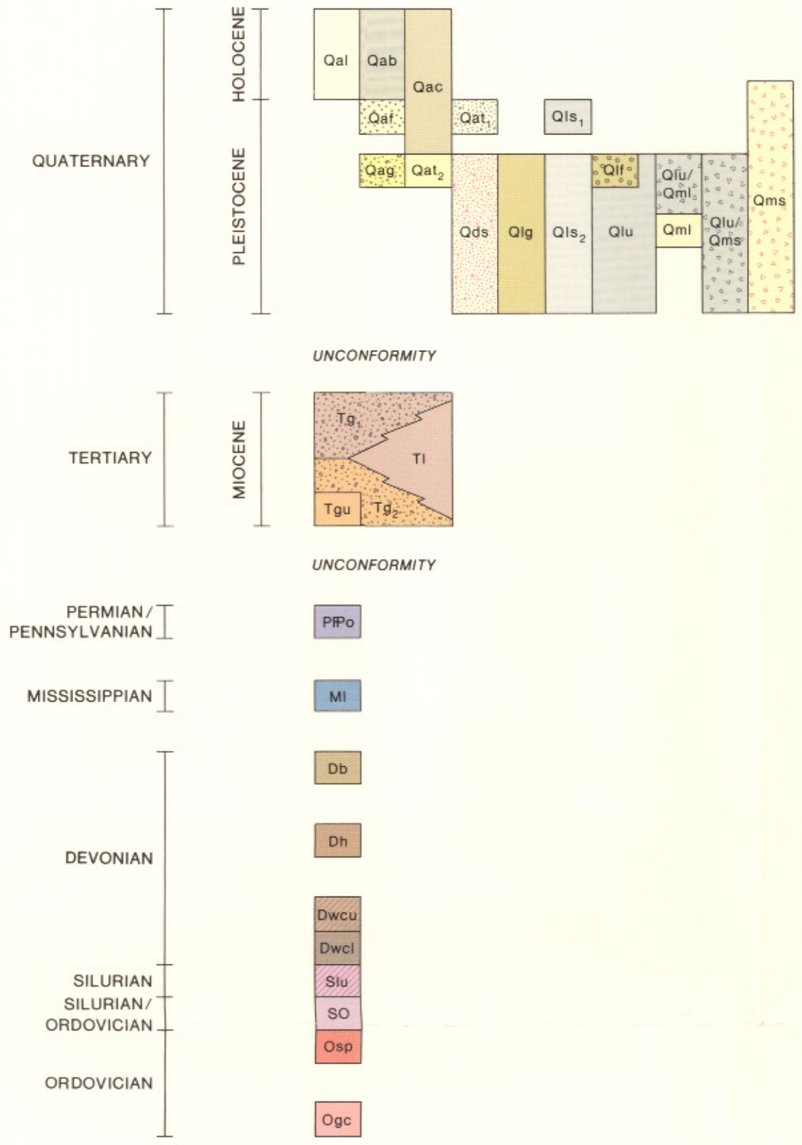
GEOLOGIC MAP OF THE CUTLER DAM QUADRANGLE, CACHE AND BOX ELDER COUNTIES, UTAH

by
C. G. Oviatt
Utah Geological and Mineral Survey

1986

QUADRANGLE LOCATION

CORRELATION OF MAP UNITS



FORMATION	SYMBOL	THICKNESS (feet)[1]	LITHOLOGY
Oquirrh Formation	PPPo	(4500?)	
Lodgepole Limestone	Ml	(970)	
Beirdneau Formation	Db	(345)	
Hyrum Formation	Dh	(490)	
Water Canyon Formation upper	Dwcu	300	
Water Canyon Formation lower	Dwcl	300+	
upper Laketown Dolomite	Slu	700	
Fish Haven and lower Laketown Formations, undivided	SO	1500	
Swan Peak Formation	Osp	(380)	
Garden City Formation	Ogc	(1330)	

[1] Numbers in parentheses are thicknesses from the Honeyville quadrangle (Oviatt, 1986); numbers without parentheses are thicknesses estimated from cross section A-A'.

DESCRIPTION OF MAP UNITS

Qal Alluvium—*fine-grained to gravelly, of flood plains and channels*

Qab Ox-bow lake deposits—*fine-grained, organic-rich*

Qac Alluvium of small ephemeral streams and colluvium derived from adjacent slopes

Qaf Alluvial-fan deposits—*at the mouth of Cottonwood Creek*

Qag Alluvial gravel—*of late Pleistocene Bear River, fills paleochannels in Qls_2*

Qlf Bar gravel—*deposited during the Bonneville Flood*

Qlg Lacustrine gravel and sand—*shore-zone deposits of Lake Bonneville and possibly pre-Bonneville lakes*

Qls_1 Lacustrine sand, silt, and clay—*deposited during Gilbert stage of Lake Bonneville*

Qls_2 Lacustrine sand, silt, and clay—*Bonneville and pre-Bonneville in age*

Qlu Undifferentiated lacustrine deposits

Qlu/Qml Thin lacustrine deposits overlying lateral-spread deposits

Qlu/Qms Undifferentiated lacustrine deposits overlying landslide deposits

Qml Lateral-spread deposits—*composed of Qlg, stabilized and non-hazardous*

Qms Landslide deposits—*derived from Qlg or from Tertiary gravel or lacustrine deposits*

Qds Deltaic sand and other fine-grained sediments, minor gravel—*deposited in Lake Bonneville by Willow and Cottonwood Creeks*

Qat_1 Thin alluvial strath-terrace deposits—*probably the same age as Qls_1*

Qat_2 Thin alluvial strath-terrace deposits—*deposited during regressive phase of Lake Bonneville*

Tgu Fanglomerate—*angular to subrounded locally derived alluvium*

Tg_1 Gravel deposits—*includes both locally derived clasts of Paleozoic rocks and exotic clasts of silicic volcanic rocks*

Tg_2 Gravel deposits—*clasts locally derived and generally finer-grained and more angular than Tg_1*

Tl Lacustrine deposits—*marl, oolitic limestone, and volcanic ash*

PPPo Oquirrh Formation—*sandstone with interbedded sandy limestone and limestone*

Ml Lodgepole Limestone—*medium to dark gray limestone, fossiliferous*

Db Beirdneau Formation—*medium to light gray dolomite, and orange dolomitic sandstone and siltstone*

Dh Hyrum Formation—*dark to medium gray dolomite*

Dwcu Upper Water Canyon Formation—*light gray to white dolomite and orange dolomitic sandstone, locally contains fish-bone fragments*

Dwcl Lower Water Canyon Formation—*light gray laminated dolomite, nonfossiliferous*

Slu Upper Laketown Dolomite—*light to medium-gray, coarsely crystalline dolomite, and dark-gray medium-grained dolomite, contains colonial corals*

SO Lower Laketown Dolomite and Fish Haven Dolomite, undifferentiated—*dark- to medium-gray dolomite*

Osp Swan Peak Formation—*white to purple quartzite*

Ogc Garden City Formation—*limestone, silty limestone, intraformational limestone conglomerate, fossiliferous*

MAP SYMBOLS

CONTACT
Dashed where approximately located

FAULTS
Dashed where approximately located; dotted where concealed

High- to moderate-angle fault; bar and ball on downthrown side, dip indicated

Buried trace of thrust fault, triangles on upper plate

STRIKE AND DIP OF BEDS

BONNEVILLE SHORELINE
Dashed where approximately located; arrow indicates direction of longshore transport and gravel spit growth

PROVO SHORELINE
Dashed where approximately located; arrow indicates direction of longshore transport and gravel spit growth

HEAD SCARP OF SLUMP OR SLIDE
Teeth on downdropped side

OTHER SYMBOLS

4790±5′ Estimated altitude of beach-ridge crest of Bonneville or Provo Shoreline

A Location of measured section in Quaternary lacustrine sediments (see text)

Passes through which water discharged from the main body of Lake Bonneville into Cache Valley during the Bonneville Flood

Prospect · Quarry · Gravel pit

Table 1. Quaternary Fossils from the Cutler Dam Area

Stratigraphic Unit	Ostracodes	Vertebrates	Plants	Molluscs
Bonneville Alloformation	typical "Bonneville" assemblage	*Mammuthus* sp. (mammoth)	wood algae	*Sphaerium* sp. *Lymnaea* sp. *Amnicola* sp. *Fluminicola* sp.
"alloformation of Cutler Dam" (lacustrine)	*Lymnocythere staplini*	*Salmo* sp. (trout)	wood, *Picea* sp. (spruce) needles	*Sphaerium* sp. *Fluminicola* sp.
"alloformation of Cutler Dam" (marginal lacustrine)	————	*Gila atraria* (Utah chub), *Cygnus buccinator* (trumpeter swan), large mammal bones	————	*Lymnaea* sp. *Helisoma* sp. *Valvata* sp.

Thanks to B.J. Albee, A.J. Feduccia, R.M. Forester, J.H. Madsen, Jr., and G.R. Smith for identifications.

Table 2. Amino-Acid Analyses on Mollusks from the Cutler Dam Quadrangle [1]

Stratigraphic unit	measured section	lab number	genus (N)	alloisoleucine/isoleucine Free	alloisoleucine/isoleucine Hydrolysate
Bonneville	E	AGL-298	*Amnicola* 3	0.19 ± .01	0.105 ± .005
Bonneville	E	AGL-297[2]	*Sphaerium* 1	0.19	0.11
Bonneville	B	AGL-271	*Lymnaea* 1	0.10	0.06
Bonneville	B	AGL-272	*Amnicola* 2	0.14	0.097 ± .004
Cutler Dam lacustrine facies	E	AGL-295	*Sphaerium* 3	0.21 ± .03	0.15 ± .01
Cutler Dam marginal lacustrine facies	D	AGL-268	*Helisoma* 3	0.184 ± .016	0.110 ± .013
Cutler Dam marginal lacustrine facies	D	AGL-269	*Valvata* 3	0.176 ± .012	0.138 ± .011
Cutler Dam marginal lacustrine facies	D	AGL-270	*Lymnaea* 2	0.157 ± .025	0.122 ± .014
Cutler Dam marginal lacustrine facies	D	AGL-274	*Lymnaea*? 3	0.203 ± .028	0.136 ± .011

[1] All analyses were run by W.D. McCoy at the Amino Acid Geochronology Laboratory at the University of Massachusetts.

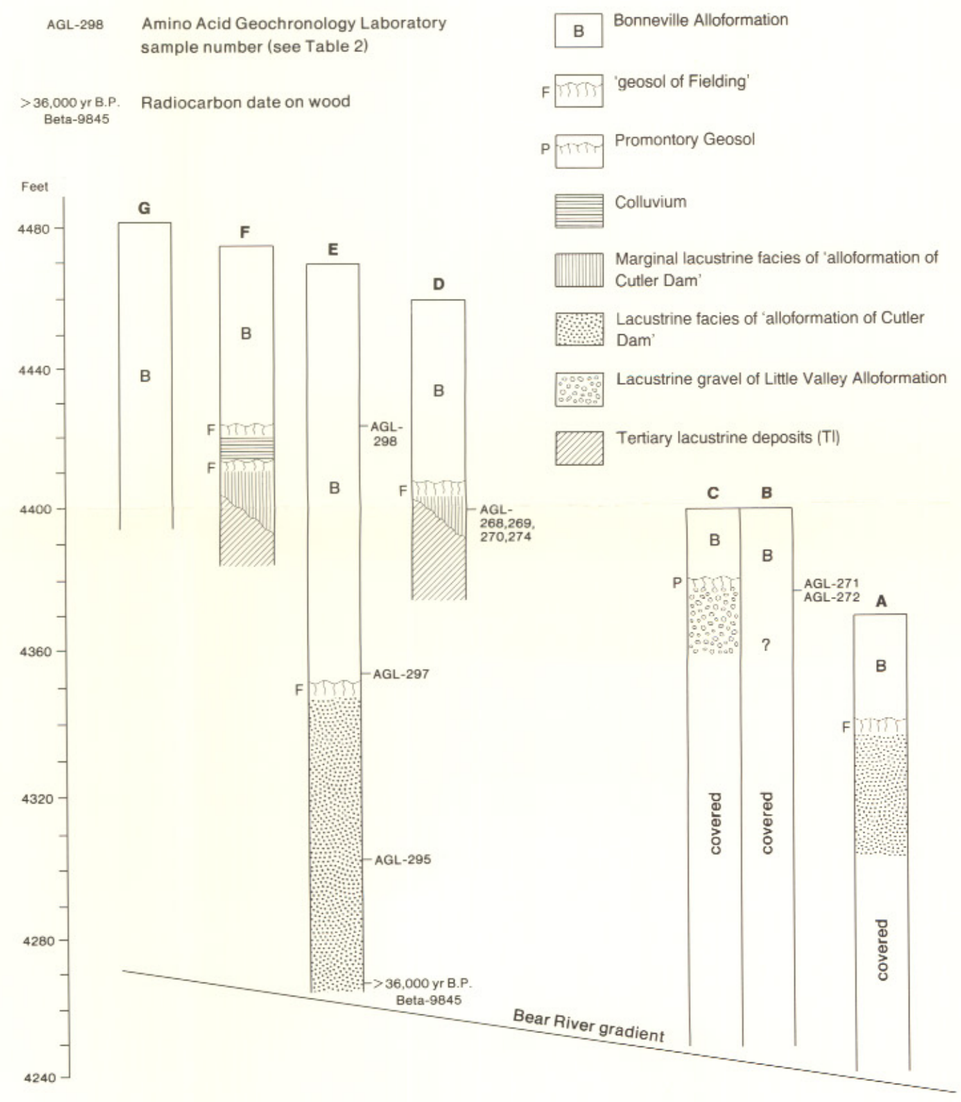
[2] Two shells from this sample had anomalously high alloisoleucine/isoleucine ratios (0.25 - 0.28 in the free fraction and 0.19 in the hydrolysate) and are interpreted as reworked from older deposits

Table 3. Amino-Acid Ratios of Mollusks from Bonneville, Cutler Dam, and Little Valley Deposits [1]

Stratigraphic Unit	*Lymnaea*	*Sphaerium*	*Amnicola*
Bonneville Alloformation (average)	.11	.12	.15
"alloformation of Cutler Dam" (lacustrine)	–	.15	–
"alloformation of Cutler Dam" (marginal lacustrine)	.13	–	–
Little Valley Alloformation (average)	.25-.30	(.25-.30[2])	.32

[1] data are derived from this study and McCoy (1981)

[2] *Sphaerium* shells of Little Valley age have not been analyzed but *Sphaerium* ratios are consistently similar to *Lymnaea* ratios of the same age (W.D. McCoy, personal communication, 1984)



Correlation of Quaternary deposits in measured sections along the Bear River, Cutler Dam quadrangle.